Student Bodies: Psycho-Education Communities on the Web

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ABSTRACT

We have developed a Web-delivered, multimedia health educational program, Student Bodies, designed to improve body satisfaction, a probable risk factor for the development of eating disorders in young women. The program includes psycho-educational content and a newsgroup for communication, and is delivered in a structured framework of weekly readings, assignments and postings to the newsgroup. Intervention group participants improved their body image, and reduced other attitudes that predispose to eating disorders.

INTRODUCTION

Internet-based dissemination of health and medical information is widespread. We were interested in investigating whether an Internet-based education program, with an associated interactive newsgroup, could develop a sense of community support and could effect a change in participant behavior. We selected eating disorders as our problem area because there is a tradition of support groups as a successful method of reducing risk for eating disorders.

Eating disorders, both overeating and starving, are widespread among college students and can lead to serious psychological and medical consequences. About 20% of college women engage in binge eating and 25% are at risk of developing eating disorders [2]. Recent studies have found that excessive weight/shape concerns appear to be common risk factors for development of partial or full syndrome eating disorders[6].

We began with a working hypothesis that, in young women at risk for eating disorders, the treatment method of face-to-face support groups and educational information could be transferred to the computer with some success [1,5,7,8]. In particular, we hypothesized that the availability of a newsgroup-based community of young women, together with engaging educational material, would provide a system for support and behavior change that would reduce the risk of eating disorders. We designed computer-assisted health education software, Student Bodies, that incorporated multimedia content, interactive individualized exercises, a newsgroup and a journal for self-monitoring of behaviors and attitudes. Young women volunteers used the software under various experimental regimens described below. Measures of risk for eating disorder were obtained before and after the experiment. We present a description of the software, the intervention program, and the evolution of the project as we studied the effectiveness of the software and the associated intervention program.

METHOD

A multimedia interactive educational program with journal and newsgroup features, Student Bodies, was developed. The project was advertised on college campuses, and volunteers were assigned randomly to experimental and control groups. The groups did not differ significantly in their history of prior treatment for eating disorders or body image. The experimental group was trained in the use of the program and in our expectations for degree of interaction. Selected psychiatric indices of body image satisfaction were measured before and after the experiment. Each experiment lasted from 8 - 10 weeks. The entire project ran from 1995 through 1998.

Participants

Participants were female students from two large, west coast universities. Recruitment for the study was accomplished through campus newspaper advertisements, flyers placed on campus bulletin boards, and presentations given in dormitories and sororities. Participants were ineligible if they reported that they were currently bulimic or anorexic, were engaged in purging behaviors, or if we measured a body mass index below 18. If study criteria were met, participants were given a consent form to read and sign. Each participant who completed the study received a payment or qualified for course credit. The study was approved by Stanford University's Institutional Review Board.

Student Bodies Software

The original software was developed in SuperCard on the Macintosh, and was delivered on CD-ROM. Subsequent versions were converted to the World Wide Web (Table 1).

Content: Student Bodies has content on the following topics deemed of interest to young women at risk for

1091—8280/99/$5.00

eating disorders: Body image; nutrition; eating disorders; exercise and weight regulation.A magazine-style presentation was chosen, with high visual quality and a conversational approach. The content was written in the style of women's magazines from the perspective of a woman a few years older and wiser than the reader, to help in understanding, assessing and improving body image. Many pages were made even more engaging with audio and video stories told by young women. While most of the stories were true, names and content were edited.

The content was divided into a number of short modules, each being one to four screen pages in length. Participants could browse any of these topics or subtopics. Besides allowing participant selection of content, the program designer could preselect pages and make them available in sequence as needed by the intervention protocol.

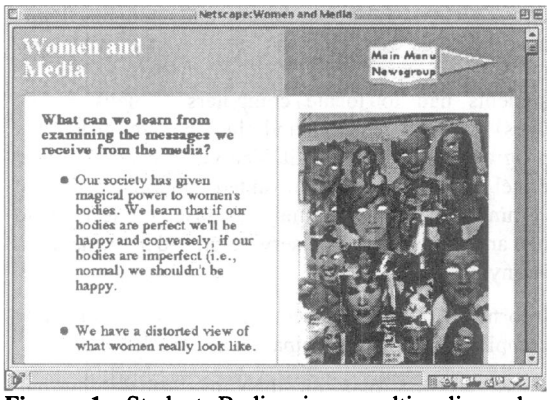

Figure 1. Student Bodies is a multimedia web-delivered program with educational content and tools for collaboration and community building.

Interactive exercise: The participant frequently is asked to respond to questions or to identify an assumption. The goal of these exercises is for students to identify their beliefs about weight and shape, test these assumptions in the real world and then challenge them.

Journal: A forms-based entry allows maintenance of a journal in two areas, body image and exercise. The confidential body image journal includes sections for information such as the social situation and the trigger event as well as the set of thoughts, feelings and beliefs elicited. Through this, the participants were able to track their own progress in dealing with their assumptions and trigger situations. The exercise journal allowed the tracking of the user's exercise regimen.

Newsgroup: The newsgroup feature was added in Model 2, as part of web-enabling of the content. Participants could post original messages or could respond to posted messages. Postings and responses were available for easy viewing on a single page, in a "threaded" manner. In later models of the software, participants could choose to characterize their posting as "success story", "just sharing" or "want feedback".

***Sample Interaction*:** Newsgroup postings could be informational or could request responses. The following is a typical posting.

Message subject: Feeling full (& guilty) Want Feedback

Student 1: I am not sure when I've had enough to eat...If I can wait until I'm full, I feel guilty...Does anybody have any tips about when to determine a point between hunger and being full?
Student 2: I actually have a piece of information that I'm hesitant to share...I have been encouraged to wait 20 minutes after my initial hunger pang...If I am truly hungry, I will still feel hungry after 20 minutes...I was hesitant to bring this up because I'm not trying to condone starvation. It was just a piece of knowledge I learned.
Moderator : Thanks for that tip. I'm sure people will be cautious with this information. Remember that if you wait too long to eat (e.g., skip a meal), you will be ravenous when you finally do eat making it REALLY easy to overdo it. If you would like more information on how to know when you've had enough to eat, feel free to read ahead to Week 6--there is a section called "Knowing When you are Full."
Student 3: I've actually found that it is good advice to eat when you're hungry and stop when you're not, even if it's after a few bites. At least for me, it's not worth it to feel disgusting after I eat because I ate when I wasn't hungry...I think it's important to listen to your stomach (not your head).

Log: All interactions with the program are maintained in participant-specific log files. Answers to interactive exercises, journal entries and newsgroup postings are also recorded and available for analysis.

Intervention:

Use of the Student Bodies software: The Student Bodies program was conducted as a psycho-educational and group communication intervention. In the first model, participants accessed the educational content on their own copy of a CD-ROM. Journal entries and answers to exercises were stored on a floppy disk and turned in to the research

assistant. Communication between participants was by e-mail that was posted to a list.

In later models, the program was conducted as a structured eight-week intervention delivered through a site on the World Wide Web. Although participants were free to explore all areas of the program, each week participants were assigned to read and complete the exercises in particular parts of the body image, nutrition, and exercise sections. Subjects were given optional assignments in the remaining sections. The structuring of the intervention increased with successive models of the program and, as will be seen below, correlated with increased compliance and improvement in the measures Adherence to the program was collected electronically and compliance feedback was provided to participants weekly by female research assistants.

Privacy: The program is password-protected for the privacy of the participants. Because the first version of the program used a CD-ROM for content and e-mail for interaction, campus e-mail was not used and an external Internet service provider was used for anonymous e-mail accounts. In subsequent, web-based models, participants logged on with aliases, retaining anonymity. Feedback from participants indicated that privacy within the group may not be an issue. In one of the most recent experiments (model 3b), participants posted photos of themselves and joined face-to-face sessions for introductions and evaluation.

Moderators: In the early model of the program, the moderator was a female psychologist. Later moderators were female research assistants who were college graduate students themselves, and may have been easier to communicate with. Because of the increased structure of the intervention in later models of the program, the moderator took an increasingly active role, both in the newsgroup discussion and in offering individual weekly feedback to participants.

Psychiatric measures:

The primary measure used in this study was the Body Shape Questionnaire (BSQ), which measures body image satisfaction, and sets a norm for bulimics, probable bulimics and non-bulimics [3]. Secondary measures dealt with eating behavior and attitudes (Eating Disorders Inventory, EDI, and Eating Disorder Examination-Questionnaire, EDEQ). In Model 3b, the Weight/Shape subscale of the EDE-Q was included as a primary measure.

Analysis:

Participant compliance with the program was measured by newsgroup postings and by percentage of screens read. Meetings and reflections were added to Model 3b. The newsgroup postings were analyzed by frequency and theme. Outcomes, in terms of risk reduction, were measured by standardized quiestionnaires for body shape perception and disordered eatingbehavior (above). At the conclusion of the study, intervention group participants completed a 21-item survey on their experience with the Student Bodies program.

RESULTS

Between 1995 and 1998, we conducted four formal studies as well as some informal evaluations of the software and the intervention program. Table 1 lists the formal studies conducted, the evolution of the Student Bodies program, and the compliance results.

Model 1: This software predated wide availability of the Web. The software was distributed to participants on CD-ROM. Responses were collected on floppy disk. Postings were via e-mail to an e-mail list. Usage of the software itself was cumbersome because students had to locate computers (usually public ones) with CD drives, and they had to install the program each time as well. The video capability was novel and attracted unwanted attention. E-mail communication was clumsy because of the need to use an external Internet service provider to maintain anonymity.

Information on the sections of online reading completed by each participant was by self-report.

There was no data on their use of the journal. Complete data was available on mail postings. Participants completed pre and post-test assessments in person.

Compliance, measured by percentage of screens accessed, using Model 1 was 53% and measures of risk reduction showed small but statistically significant improvement. Results are presented in Winzelberg et al [9] for Model 1.

Model 2: The software was ported to the Web and communication was integrated into the program using a web-based newsgroup. Ease of usage improved dramatically. Presentation through the web browser meant that participants did not have to load components of the program to the hard disk. Participants could choose to stay anonymous on the newsgroup by using an alternate login name. When using the software, sections of online reading were recommended but not required. Newsgroup posting was required.

All use of the software was tracked automatically. Participants posted a total of 347 messages. The average number of postings per participant over the eight weeks of the intervention was 10.6 (SD = 9.5). The content of newsgroup postings were analyzed and categorized. Participants completed pre and post-test assessments as well as a 3-month followup assessment. Compliance using Model 2 went up to 63.5%. For subjects who completed all measures, significant differences between intervention and control groups were found between baseline and follow-up measurements on the BSQ ($F = 5.78$, $p < .02$) and the EDI Drive for Thinness ($F = 4.29$, $p = .044$).

	Model 1	Model 2	Model 3a	Model 3b
Time	1995	Jan-Mar. 1997	Apr-June 1998	Apr-June 1998
Institution	University A	University B	University B	University A
# of participants (SB / control)	27 / 30	31 / 30	31 / 31	27 / 24
# of students	57 / 52 / 45	61 / 53 / 48	62 / 61 / 56	76 / 68 / 59
Participants	High weight concern	High weight concern	High risk (BSQ>110)	High weight concern
Software	CD-ROM	Web	Web	Web
Newsgroup	E-mail list	Web newsgroup	Web newsgroup	Web newsgroup
Interface	Online, floppy disk	Online only	Online only	Online, readings, meetings, written reflections
Intervention	"grazing" approach	Recommendations	structured with requirements	structured with requirements
Newsgroup moderator	Clinical psychologist	Graduate student in counseling psychology	Graduate student in counseling psychology	Recent graduate of masters program in sociology
Privacy	Anonymity	Anonymity	Anonymity	No anonymity (personal profile on web w/pictures; group meetings)
Personal contact	None	None	None	3 group meetings
Approach	Cognitive-behavioral guided self-help	Cognitive-behavioral guided self-help	Cognitive-behavioral guided self-help	Cognitive-behavioral guided self-help & academic
Measures used	BSQ, EDI (drive for thinness, bulimia subscales), EDEQ	Same + social support questions	Same + social support questions	Same + social support questions
Reminders	None	Phone	Phone	E-mail
Subjects were paid	$10	$25	$25	Received course credit
Compliance (% of screens read)	53% (self report)	63.5%	76.8%	80.2%

Table 1. Evolution of the Student Bodies program and intervention.

Model 3: Model 3 was more structured than the earlier interventions. Readings, postings and journal entries were required. The moderator sent gentle reminders if a participant missed an assignment. An additional academic component was added to model 3b, at the suggestion of previous participants. Participants were required to read at least one article each week from a course reader containing readings from psychology journals and feminist-perspective books. A one- to two-page reflection paper was required, as well, and was sent via e-mail to the moderator. Results are still being analyzed. Compliance with software and newsgroup requirements was higher than in Model 2 .

Effectiveness of program

In summary, there were small but significant effects for Model 1. Model 2 showed greater, positive results. Model 3a and 3b are still being analyzed (initial analyses show decreases in weight concerns and disordered eating behaviors/attitudes). Compliance has increased with each sucessive version, demonstrating promise for the use of this technology.

For participants who completed the program and followup, significant differences were found between intervention and control groups, and between baseline and follow-up measurements on the BSQ. The intervention group showed a decrease in BSQ after the intervention, with a further decrease in the 3 month followup.

DISCUSSION

This study demonstrated that an Web-based, computer-assisted, health education program can reduce risk factors associated with the development of eating disorders. Intervention group participants improved their body image, and reduced other attitudes that predispose to eating disorders.

The Student Bodies model (software and intervention) evolved from a CD-ROM-based program with unstructured intervention to a Web-delivered program with structured weekly assignments and required interaction. From compliance measures alone, it appears that the Student Bodies model has evolved in a direction that makes it more useful and compelling. Availability of an online educational environment and a newsgroup-based virtual community, together with the structure imposed by weekly assignment and interaction with the facilitator, present an environment that the participants are willing to use.

ACKNOWLEDGEMENTS

This project was supported partially from grants by Cambell Soup, the McKnight Foundation, and DARPA (N66001-95-C-8618). Versions of the Student Bodies software were developed by P.Constantinou, R.Mather, A.Pothen and R.Pichumani. Portions of the results reported here were presented in Dev et al [4].

REFERENCES

1. Burnett KF, Taylor CB, Agras WS (1985). Ambulatory computer-assisted therapy for obesity: A new frontier for behavior therapy. Journal of Consulting and Clinical Psychology, 53, 698-703.

2. Bushnell JA, Wells JE, Hornblow AR, Oakley-Browne MA, Joyce P. (1990). Prevalence of three bulimia syndromes in the general population. Psychological Medicine, 20, 671-680.

3. Cooper P, Taylor M, Cooper Z, Fairburn C. (1987). The development and validation of the body shape questionnaire. International Journal of Eating Disorders, 6, 485-494.

4. Dev P, Winzelberg AJ, Celio A, Taylor CB, (1999). Virtual communities in computer-assisted health education. In Proceedings of the Virtual Worlds and Simulation Conference, San Francisco.

5. Gleason N. (1995). A new approach to disordered eating -- Using an electronic bulletin board to confront social pressure on body image. Journal of American College Health, 44, 78-80.

6. Killen J, Taylor CB, Hammer LD, Litt I. (1993). An attempt to modify unhealthful eating attitudes and weight regulation practices of young adolescent girls. International Journal of Eating Disorders, 13, 369-384.

7. Newman MG, Consoli A, Taylor CB (1997). Computers in assessment and cognitive behavioral treatment of clinical disorders: Anxiety as a case in point. Behavior Therapy, 28, 211-235.

8. Rubin DH, Leventhal JM, Sadock RT, et al. (1986). Educational intervention by computer in childhood asthma: a randomized clinical trial testing the use of a new teaching intervention in childhood asthma. Pediatrics, 77, 1-10.

9. Winzelberg AJ, Taylor CB, Altman T, Eldredge KL, Dev P, Constantinou PS.(1998). Evaluation of a computer-mediated eating disorder intervention program. International Journal of Eating Disorders24, 339-350.

10. Winzelberg AJ, Eppstein D, Wilfley D, Eldredge K, Dasmahapatra R, Dev P, Taylor CB (1999 submitted). Effectiveness of an Internet-based program for reducing risk factors for eating disorders. Journal of Consulting and Clinical Psychology.